

a photogate for controlling the accumulation of photo-generated charge in said photosensitive area;

a first and a second gate stack;

a first insulating layer in contact with said substrate and beneath each of said first and second gate stacks; and

a nitrogen containing second insulating layer in contact with said substrate and beneath said photogate.

REMARKS

This Preliminary Amendment is being filed together with a Request for Continued Examination. Claim 1 has been amended to include the recitation of "a first and a second gate stack" and "a first insulating layer in contact with said substrate and beneath each of said first and second gate stacks." Claim 1 therefore defines an imaging device having two insulating layers: a first insulating layer disposed beneath each of the first and second gate stacks, and a nitrogen containing second insulating layer disposed beneath the photogate. Support for claim 1 is found at specification page 16, lines 14-16, and in the depiction of the imaging device in Figs. 8-10.

The imaging device defined by claim 1 distinguishes over U.S. Patent No. 5,804,845 to Anagnostopoulos et al. applied in the Office Action of February 15, 2002.

The Office Action relied upon Figs. 2A,¹ 3B, and 3C of Anagnostopoulos. Each of Anagnostopoulos' Figs. 3A, 3B, and 3C, however, depicts a structure having a single insulating layer. For example, the structure depicted in Anagnostopoulos' Fig. 3A has an ONO stack "formed by nitride layer 34, top oxide layer 35, and bottom oxide layer 36" (column 5, lines 2-3). As is evident from Fig. 3A, the ONO stack lies beneath the ITO electrodes 30, and the bottom oxide layer 36 portion of the ONO stack also lies beneath the polysilicon electrodes 32. In the structure depicted in Fig. 3B, the entire ONO stack lies beneath both electrodes. In fact, Anagnostopoulos even explicitly states as much, to wit: "Here, ITO electrodes 30 and polysilicon electrodes 32 are formed upon an ONO stack comprising three layers that completely run beneath the electrodes" (emphasis added) (column 5, lines 15-17).

None of the embodiments of Anagnostopoulos relied upon in the Office Action anticipates Applicant's claimed invention, which includes a first insulating layer disposed beneath each of the first and second gate stacks, and a nitrogen containing second insulating layer disposed beneath the photogate.

¹ Applicant's representative presumes that the Examiner intended to rely upon Fig. 3A of Anagnostopoulos rather than Fig. 2A, since the description associated with Fig. 3A refers to the ONO stack relied upon by the Examiner.

Favorable action on the merits is respectfully requested.

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Respectfully submitted,

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Version With Markings to Show Changes Made

In the Claims:

Please amend claim 1 as follows:

1. (Twice amended) An imaging device comprising:

a substrate;

a photosensitive area within said substrate for accumulating photo-generated charge in said area;

a photogate for controlling the accumulation of photo-generated charge in said photosensitive area; [and]

a first and a second gate stack;

a first insulating layer in contact with said substrate and beneath each of said first and second gate stacks; and

a nitrogen containing second insulating layer in contact with said substrate and beneath said photogate.